CLAIMS

1. SYSTEM FOR MEASUREMENT OF OPTICAL PARAMETERS AND CHARACTERIZATION OF MULTIPORT OPTICAL DEVICES constituted by process control systems, one or more sources of optical test signal (tunable laser source), optical circuit including optical fiber and several other optical components arranged so as to constitute an interferometric optical arrangement, optical connectors, optoeletronic interfaces, photodetectors, analogical electronic circuits, digital electronic circuits for digital signal processing and electronic circuits for data acquisition, characterized by the fact that the test and reference optical signals traverse paths with any lengths, that can be identical or distinct, the optical signal traversing at least one of said paths of interferometer being phase- and/or frequency-modulated.

2. METHOD FOR MEASUREMENT OF OPTICAL PARAMETERS AND CHARACTERIZATION OF MULTIPORT OPTICAL DEVICES based in optical interferometry concept, using two optical paths in which in one of these the device under test (DUT) is inserted, and in which one or more optical phase / frequency modulators are inserted, characterized by the fact that the signals of both arms are summed at a same photodetector that translates to the electric domain the heterodyning of the optic signals, which contain the information of the optical characteristics of the DUT.

3. METHOD FOR MEASUREMENT OF OPTICAL PARAMETERS AND CHARACTERIZATION OF MULTIPORT OPTICAL DEVICES as claimed in claim 2, characterized by the fact that the system operates equally well with continuous wavelength sweeping as with step wavelength sweeping of the tunable laser source.

4. METHOD FOR MEASUREMENT OF OPTICAL PARAMETERS AND CHARACTERIZATION OF MULTIPORT OPTICAL DEVICES as claimed in claim 2, characterized by the capability of simultaneous

interferometric characterization in reflection and transmission of all ports of multi-port optical devices using phase and/or frequency optical modulators in the arms of the interferometer.

5. METHOD FOR MEASUREMENT OF OPTICAL PARAMETERS AND CHARACTERIZATION OF MULTIPORT OPTICAL DEVICES as claimed in claim 4, characterized by the capability of determininig the polarization characteristics of the DUT for the two ortogonal polarization modes of light, the polarization discrimination being provided by distinct phase and/or frequency modulators installed in the interferometer arms.

6. METHOD FOR MEASUREMENT OF OPTICAL PARAMETERS AND CHARACTERIZATION OF MULTIPORT OPTICAL DEVICES as claimed in claim 2, characterized by the fact that the transfer of the optical signals between the diverse ports of the DUT is described by means of the Optical "S"-Parameters where each "Sxy" parameter is represented using the formalism of Jones (Jones matrix) and/or the formalism of Müller (Müller matrix) and where all the determinations of the optical characteristics of the DUT (bandwidth, phase, time delay, chromatic dispersion, 2nd order chromatic dispersion, reflectance, reflection coefficient, transmittance of the port "y" to the port "x" and vice versa, transmission coefficient of the port "y" to the port "x" and vice versa, insertion loss, polarization dependent loss, polarization mode dispersion (DGD/PMD), 2nd order DGD, etc.) are based on said "Sxy" parameters.

7. METHOD FOR MEASUREMENT OF OPTICAL PARAMETERS AND CHARACTERIZATION OF MULTIPORT OPTICAL DEVICES as claimed in claim 4, characterized by the fact of the measurement of the different optical parameters in the different propagation paths is furnished by the arrangement of the optical interferometric circuits according to different optical configurations, each individual

configuration corresponding to the measurement of a specific optical "S"-parameter of interest.

8. METHOD FOR MEASUREMENT OF OPTICAL PARAMETERS AND CHARACTERIZATION OF MULTIPORT OPTICAL DEVICES as claimed in claim 7, characterized by the fact of the optical interferometric circuitry is equivalent to the overlapping several individual optical configurations related to the simultaneous measurement of several optical "S"-parameters.

9. METHOD FOR MEASUREMENT OF OPTICAL PARAMETERS AND CHARACTERIZATION OF MULTIPORT OPTICAL DEVICES as claimed in claim 4, characterized by the fact that the complete determination of the transference matrix ("S"- parameter matrix) of multi-port optical devices is based on the concurrent use of optical techniques (interferometry, polarization diversity, phase and/or frequency optical modulation, optical beam coupling and division, generation of optical signal, signal beating, photodetection etc.), usual analogical and digital electronics techniques (generation of modulating signals, amplification, analogical filtering, digital filtering, "analogical Lock-in" technique, digital "lock-in" technique, analogical signal processing, digital signal processing, FFT techniques - "Fast Fourier Transform", digital communication etc.) and specific software (software for data acquisition, data analysis, processing of results, graphic user interface software etc.).

10. METHOD FOR MEASUREMENT OF OPTICAL PARAMETERS AND CHARACTERIZATION OF MULTIPORT OPTICAL DEVICES as claimed in claim 4, characterized by the fact of the interferometric optical circuits stabilization against thermal variations or mechanical vibration is provided by means of the use of a second interferometer operating within the optical test circuits, functioning in a wavelength falling outside the test wavelength band, operating according to the WDM (wavelength division multiplexing) techniques.

11. SYSTEM FOR MEASUREMENT OF OPTICAL PARAMETERS AND CHARACTERIZATION OF MULTIPORT OPTICAL DEVICES as claimed in claim 1, characterized by the fact of the optical interferometer can be comprise different physical paths for propagation and conduction of the optical signal, such as: optical fibers, planar waveguides, free space (FSO) etc..

12. SYSTEM FOR MEASUREMENT OF OPTICAL PARAMETERS AND CHARACTERIZATION OF MULTIPORT OPTICAL DEVICES as claimed in claims 1 or 10, characterized by the use of optical phase and/or frequency modulators in the arms of the interferometer, said modulators being constructed according to using any known possible technologies, such as techniques of refractive index change, acusto-optic effect in crystals, length propagation changes, electron-optic effect etc..